C. C. MAURICE.

Process of Producing Paper Printing Surfaces.

No. 196,466. Patented Oct. 23, 1877.

Fig. 1.

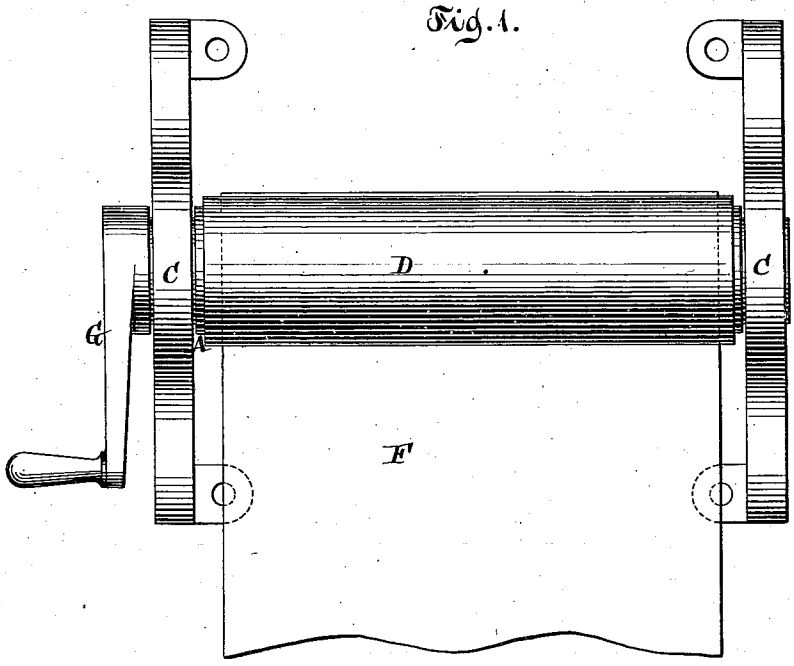
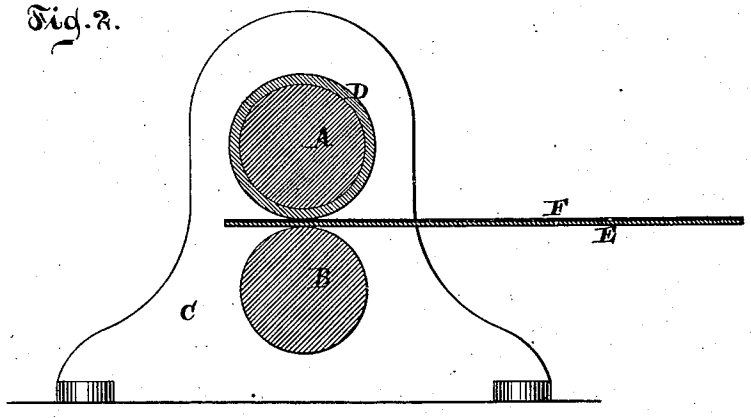


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES C. MAURICE, OF NEW YORK, N. Y.

IMPROVEMENT IN PROCESSES OF PRODUCING PAPER PRINTING-SURFACES.

Specification forming part of Letters Patent No. **196,466**, dated October 23, 1877; application filed March 28, 1877.

To all whom it may concern:

Be it known that I, CHARLES C. MAURICE, of the city, county, and State of New York, have invented a new and Improved Process for Producing Paper Surfaces to Print from, which invention is fully set forth in the following specification.

This invention consists in the process of preparing paper, tissue, or parchment, for printing directly from, after the manner of lithography, by treating the same to the several steps mentioned, in the order of their succession, and with the various ingredients hereinafter specifically set forth.

In the accompanying drawing I have illustrated an apparatus which is adapted to be used in carrying out my said invention, in which drawing—

Figure 1 represents a plan or top view of the apparatus. Fig. 2 is a vertical cross-section thereof.

Similar letters indicate corresponding parts.

The letters A B designate two rollers, having their bearings in a frame composed of two standards, C C, and one of which rollers is provided with a sleeve or covering, D, of india-rubber or its equivalent material. With the rollers A B is combined a bed composed of two plates, E F, placed upon each other, and which are placed between the rollers A B at one end, the lower one of said plates being preferably made of zinc and the upper one of tin. On the shaft of one of the rollers A B is mounted a crank, G, for imparting a revolving motion to the rollers.

In carrying out my invention, I place a blank sheet of paper on the lower or zinc plate E, having previously removed the upper plate F, and lay upon it a pattern-sheet containing the drawing or writing or other work to be reproduced, this work being made with lithographic ink, crayon, or any other lithographic material. This pattern-sheet is placed with its face downward, in contact with said blank sheet, and on top of it is placed a damp sheet of paper of sufficient size to cover the entire rear surface thereof. The whole is then covered by the plate F, and a revolving motion is given to the rollers A B, successively, in opposite directions, so as to draw the bed-plates E F forward and backward, say ten times, so that the work is subjected to pressure between the rollers A B. I then lift up the top plate F, and remove the damp sheet of paper, and put another damp sheet of paper in its place—that is to say, on the original or pattern sheet. The top plate F is then replaced and the whole a second time subjected to pressure between the rollers A B, in the manner stated. The second damp sheet is removed, and, after damping thoroughly with a sponge, water is allowed to remain on the original or pattern sheet a sufficient length of time to thoroughly soak the latter, and, by this means, together with the pressure referred to, the "work" is transferred to the blank sheet of paper, and the latter assumes the form of what I term a "printing-sheet," or a sheet to take impressions from.

The primary object of transferring the work from the original to a printing sheet, as specified, instead of using the said original as a printing-sheet, is to place the work in the proper reverse position, which is necessary, especially when the work consists of writing or type letter. However, when the copy to strike off from the printing-sheet is done upon tissue, tracing, or translucent paper, the transfer is not necessary, as the said original can be used as a printing-sheet, the work to be duplicated being done upon the said blank sheet of paper.

Previous to using the sheet of paper as a printing-sheet, however, it must be prepared in the following manner: If the printing-sheet is composed of sized paper containing either rosin, or sulphate of calcium, or sulphate of baryta, or analogous substances, I submit it, before printing therefrom and after the work has been done directly on it or transferred thereto, to the following treatment: I immerse said sized paper in water containing two per cent. nitric acid and thirteen per cent. gum-arabic. I then let the paper dry, and afterward wash it with pure water. I then ink the work contained on the sheet, by the ordinary lithographic process, until it is perfectly black. I then again immerse the paper in water containing thirteen per cent. nitric acid and two per cent. gum-arabic, and repeat the operation

of washing it and inking the work. I then immerse the paper in water containing fifteen per cent. gum-arabic, and let it dry. I then wash it a third time with pure water, and lay it on the zinc plate E, the surface of which is previously covered with printing-ink by means of an inking-roller, or in any other desirable way, so that the back of the sheet becomes cemented to the said plate E. The upper surface of the sheet, where the work is, is then "rolled up" in the same way as practiced by lithographic printers in "rolling up" on lithographic stones—that is to say, by dampening the paper with clean water. But when a certain number of copies is wanted, instead of using pure water, I use water containing twenty-five per cent. or fifty per cent. of glycerine, and I cover the printing-sheet with that solution one hour before printing, and by means of a printing or copying press of any suitable construction.

If the printing-sheet is composed of unsized paper, I prepare it before doing directly upon or transferring the work thereto, as follows: I immerse the said unsized sheet of paper in concentrated sulphuric acid containing twenty per cent. of pure water, a sufficient length of time for the disintegration of the cellulose of the paper—about one minute. I then immerse the sheet in water saturated with chloride of calcium, and then in water containing eight per cent. ammoniac, and then immerse it in pure water. It is then successively immersed in water containing six per cent. or eight per cent. gum-arabic, and afterward in water containing fifteen per cent. nitric acid. It is then again immersed in pure water. I then allow the sheet to dry, and when it commences to curl I subject it to pressure in any convenient way. The sheet is then ready to receive any kind of lithographic work, and is adapted to be used similarly to lithographic stones.

In all cases I may use parchment-paper or real parchment, or analogous substances, as a substitute for unsized paper prepared according to the formula last described; but, although it gives excellent results when it is well prepared, such parchment is inferior to the paper prepared according to said formula.

I can also use any other paper or tissue which is insoluble in water, but will slightly absorb the same, and which is adapted to strongly absorb lithographic ink. I can also use any paper which is covered on one of its surfaces with metal.

What I claim as new, and desire to secure by Letters Patent, is—

The process of preparing a sheet of paper, tissue, or parchment for printing directly from, after the manner of lithography, by treating the same to the several steps mentioned, in the order of their succession, and with the various ingredients hereinbefore specifically named, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 23d day of March, 1877.

C. C. MAURICE. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.